

THE CLIMATOLOGY OF ANTIGUA, W. I.

By WILLIAM H. ALEXANDER, dated April 16, 1901.

The island of Antigua lies to the eastward of St. Kitts in latitude $17^{\circ} 5'$ north, longitude $61^{\circ} 50'$ west. It contains an area of 108 square miles and is circular in form, being some 70 miles in circumference. The coasts are indented by numerous bays and, being high and rocky, are quite dangerous to navigation. The surface of the island is level, in the main; the highest point, McNish Mountain, is only 2,200 feet above sea level. The hills are probably less than 1,500 feet in elevation. Owing to a light rainfall the elevated portions of the island are not clothed with that luxuriant tropical vegetation to be seen in other of the Leeward Islands such as St. Kitts, Montserrat, and Dominica, but present to the eye a rather desolate, uninviting appearance. The valleys, however, stand in marked contrast to the hills, being arrayed in all the beauty and vernal richness of a tropical climate. There are no rivers and but few springs, and these are brackish. The people are dependent upon rainfall for a water supply, and have in former times suffered great loss and inconvenience from droughts. About one-third of the land is suitable for agricultural purposes.

As regards its geological structure, and in accordance with the character of its surface, it may be divided into three portions. In these three divisions marked contrasts are exhibited in their geological relations. On one side, the western, the rocks are of an igneous character, denoting violent action, akin to volcanic, but without actual eruption; on the other side, the eastern, the character of the rocks is totally different, being chiefly calcareous freestone and limestone; in the middle space, which is a plain, bordered on both sides by hills, both kinds of action may be said to be exhibited, the former in the indurated clays and silicious cherts, the latter in the numerous petrifications (wood and coral) imbedded in its soil.

The soils of the island are not less varied than its rocks; stiff clays may be considered as predominating in the western division, lighter ones and calcareous marls in the eastern and middle. These are generally productive, especially the marls, of extraordinary fertility.—*C. A. Harris.*

The climate of Antigua for a tropical one is decidedly healthful, and excepting for the hot months is most agreeable. The remarkable dryness of the atmosphere renders it highly favorable for people subject to chest diseases, which are almost unknown among Antiguanians. The prevailing diseases of the island are confined almost entirely to the blacks and may be attributed to uncleanly habits, bad diet, and neglect.

St. Johns, the principal town of the island, has a population of about 9,500, and is situated upon the northwest coast. The town covers an area of 150 acres of land and is built upon a slight declivity toward the sea. It is not only the seat of the island government but of the general government of the Leeward Islands as well. The population of the island in 1881 was 34,964, and the probabilities are that the present population differs very little from that figure.

The agriculturist is mainly engaged in the cultivation of the sugar cane from which he obtains sugar, molasses, and rum. The average sugar crop is about 12,000 hogsheads. The soil is very suitable for the growing of cane, which lives and thrives even under the most adverse circumstances. The laborers, when they can get the ground, cultivate for their own use small crops of yams, potatoes, guinea corn, etc. The wages of a field laborer vary to some extent, but generally are between 16 and 20 cents per day for a man; for a woman 12 to 16 cents per day is the usual pay. Domestic servants are paid \$4 to \$8 per month for a man, and \$2.40 to \$4.80 for a woman. Mechanics get from 36 to 48 cents per day. On account of the low wages and the limited demand for laborers, especially field laborers, there has been a steady emigration from the island of late years.

For more than ten years Mr. Francis Watts, chemist and government analyst for the Leeward Islands, has kept at Antigua, in connection with his other work, a complete series

of meteorological records and has now kindly placed the same at my disposal. Mr. Watts being not only a scientific man but a close student of meteorology as well, has furnished the climatologist with material of more than ordinary value. The data were compiled by Mr. Watts himself or under his immediate supervision. I have worked the records into the accompanying tables, 1-6, each of which is self-explanatory and, it is confidently believed, worthy of careful study.

Relative to the instruments used and their exposure, a few words ought to be said. Referring to Table 1, it should be noted that the record for 1889 and for January, February, and March of 1890, forms no part of Mr. Watts's record. These data are from a record kept at the Public Library, St. Johns. The barometer readings are those of an ordinary Fitzroy barometer and the temperatures are the readings of the attached thermometer and are, therefore, not true atmospheric temperatures. The barometer readings are uncorrected except for the three months in 1890 when a correction for elevation only was applied.

When Mr. Watts began the work on April 1, 1890, he exposed his instruments at the old laboratory, the barometer being 37 feet above sea level. A Fitzroy barometer was used until April 14, 1891, all readings being corrected for elevation but not for temperature. On April 15, 1891, a mercurial barometer with Fortin cistern was installed at the same elevation, and the readings were corrected for temperature and elevation but not for instrumental error. The corrections used were taken from an article on Barometers in Henry Watts's Dictionary of Chemistry, Vol. I, and were approved by the Meteorological Office, London.

The thermometers were all standard instruments and were exposed in a Stevenson's screen, the double bottom and top of which each contains an air space. The screen was placed about four feet above the ground, but it appears that the surroundings were not favorable for the best results and the temperatures were a little high. The wet thermometer was of the cup-and-wick pattern, and the dew-point was found according to the rule and the data given in Henry Watts's Dictionary of Chemistry, Vol. III, p. 227 (old edition).¹

This arrangement obtained until November 30, 1895, when all the instruments were moved to the new laboratory. The cistern of the barometer was now 24 feet instead of 37 feet above the sea. The thermometer screen was now exposed some 20 feet above the ground on a south gallery, where doubtless radiation had an important effect upon the instruments within, thus still giving too high temperatures. This, I understand, is also Mr. Francis Watts's opinion on this point. On June 1, 1900, the screen was again moved, this time to the botanic station about one-fourth of a mile eastward of the town, and was placed in a level, open space, about 4 feet above a grass-covered lawn. The screen is now 70 or 80 feet above the sea and very favorably surrounded.

On December 23, 1893, a Robinson anemometer was set up at Skerretts, about 1 mile to the eastward of St. Johns. The cups have a diameter of 3 inches, and the arms from outside to outside of cups measure $15\frac{1}{4}$ inches. The anemometer is exposed 17 feet above the ground in a broad, open, and level space. The exposure of this instrument is, apparently, all that could be desired.

A 9-inch rain gage was used, being so placed that the rim was 4 feet above the ground. Unfortunately the gage was not only moved a number of times, but at no time was the exposure free from surrounding influences, and therefore not the best. The gage at the Public Library, so far as known, was never moved, but was also probably not free from local influences. On June 1, 1900, Mr. Watts had his gage moved to a good location outside of the town.

¹ That is to say, the observer used the revised Glaisher's factors. See Hygrometrical Tables, James Glaisher, London, 1869, p. iv.—Ed.

Fortunately, however, we are not limited to this one record for our knowledge of the rainfall on the Island of Antigua. Table 5, for instance, gives the monthly and yearly means for a number of years, based upon quite a large number of stations well distributed over the island. At many of these stations the gages are not only well exposed, but have never been moved. In this connection, it may be interesting to compare the monthly means of Table 2 with those of Table 5, or, in other words, to compare the rainfall at St. Johns with that of the entire island. It will be noted that the fall at St. Johns for all months in the year, except September and November, is greater than that of the mean for the island and the mean annual fall at St. Johns exceeds the mean for the island by nearly 5 inches.

TABLE 1.—Monthly mean pressure and temperature data for St. Johns, Antigua.²

| Date. | Air pressure. | | Attached thermometer. | |
|-------------------|----------------|----------------|-----------------------|-----------|
| | 9 a. m. | 3 p. m. | 9 a. m. | 3 p. m. |
| 1889. | | | | |
| January..... | Inches. 30.110 | Inches. 30.110 | ° F. 79.0 | ° F. 82.0 |
| February..... | 30.140 | 30.110 | 77.0 | 80.0 |
| March..... | 30.130 | 30.150 | 80.0 | 82.0 |
| April..... | 30.130 | 30.120 | 82.0 | 82.5 |
| May..... | 30.120 | 30.110 | 81.5 | 82.5 |
| June..... | 30.130 | 30.150 | 81.5 | 78.0 |
| July..... | 30.130 | 30.140 | 86.0 | 87.5 |
| August..... | 30.110 | 30.120 | 86.0 | 87.0 |
| September..... | 30.100 | 30.120 | 81.0 | 82.1 |
| October..... | 30.090 | 30.100 | 83.0 | 83.0 |
| November..... | 30.120 | 30.080 | 80.0 | 84.0 |
| December..... | 30.070 | 29.990 | 77.0 | 79.0 |
| Annual means..... | 30.115 | 30.103 | 81.2 | 82.5 |
| 1890. | | | | |
| January..... | 30.060 | 30.080 | 77.0 | 77.0 |
| February..... | 30.150 | 30.130 | 74.0 | 71.0 |
| March..... | 30.110 | 30.110 | 83.0 | 80.0 |

NOTE.—The observations were made on local time.—Ed.

The data bearing upon the rainfall of Antigua are very complete and, to me, at least, very interesting. A careful study of the accompanying tables will reveal to the thoughtful many interesting points. Slight discrepancies in the means of the various tables may appear, but these were unavoidable, being the result of the various combinations and methods employed in obtaining the means, some of which were computed by Mr. Watts and some by myself. These differences, however, are immaterial in this connection. The means of Table 5 are, perhaps, slightly too great, for the reason that the period is not only short (twelve years), but contains the phenomenally wet year of 1889, when the mean for the island was about 60 per cent above the normal.

² The original Table 1 in Mr. Alexander's paper contained the monthly means and extremes of pressure, temperature, rainfall, wind, etc., arranged in chronological order from January, 1889, to December, 1900, inclusive, as copied from the record of Mr. Watts at St. John's, Antigua. As this arrangement was not conducive to the taking of monthly means and other climatological studies, the Editor has submitted this extensive table to Mr. H. H. Kimball for further elaboration, and all of Mr. Alexander's figures will be found rearranged in Mr. Kimball's article on the seasonal variations of the island of Antigua, except the data given in the preceding columns, which represent observations made by some unknown observer with the instruments kept at the Public Library in St. Johns, and the rainfall data, which Mr. Alexander had himself rearranged in his Tables 2 and 3.—Ed.

Referring to Table 6, we find that of the twenty-six years there represented thirteen were below the normal and thirteen were above. The maximum deficiency, 17.22 inches, occurred in 1875, and the maximum excess, 27.59 inches, in 1889. Then, too, I can not refrain from inviting attention to the secular means in Table 5, which show a peculiar variation in the monthly averages beginning with May and concluding with December, while the departures in Table 6 reveal in a conspicuous manner the periods of large and small departures. They seem to indicate that for each period of seven or eight years, five or six years in succession will have a very nearly normal rainfall, followed by two years of comparatively large departures. For instance, the six years from 1876 to 1881 show very slight departures from the normal, but for the two following years, 1882 and 1883, the departures are very large, one above and one below the normal. Then comes another period of five years of nearly normal rainfall, followed again by two years of abnormally large departures, one above and one below the normal, and so on.

Taking 12,000 hogsheads of sugar as an average crop, and 46.00 inches of rain as the average fall, it would appear that for each inch of rain that falls the island produces 261 hogsheads of sugar.

TABLE 2.—Monthly rainfall at St. Johns, Antigua, from April, 1866, to December, 1900, inclusive.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---------------|----------|-----------|--------|--------|-------|-------|-------|---------|------------|----------|-----------|-----------|---------|
| 1866 | 2.15 | 3.56 | 0.63 | 6.11 | 11.02 | 10.36 | 2.12 | 2.25 | 3.14 | 6.71 | 2.19 | 1.37 | 24.32 |
| 1867 | 2.08 | 1.50 | 1.63 | 1.60 | 2.24 | 2.12 | 3.79 | 2.95 | 7.52 | 3.20 | 6.46 | 5.22 | 63.92 |
| 1868 | 2.38 | 2.63 | 2.00 | 0.88 | 1.86 | 5.70 | 2.04 | 3.77 | 6.83 | 2.80 | 5.22 | 2.21 | 42.51 |
| 1869 | 4.60 | 0.84 | 2.85 | 0.79 | 1.64 | 2.13 | 5.33 | 6.82 | 2.55 | 4.35 | 8.04 | 2.28 | 38.27 |
| 1870 | 3.47 | 1.49 | 3.05 | 4.20 | 3.30 | 1.81 | 2.93 | 2.52 | 4.01 | 3.40 | 1.97 | 2.33 | 37.73 |
| 1871 | 1.64 | 0.68 | 1.68 | 1.04 | 1.52 | 2.22 | 5.77 | 2.16 | 11.86 | 5.87 | 4.60 | 5.19 | 44.23 |
| 1872 | 4.05 | 1.17 | 4.23 | 1.11 | 1.83 | 1.39 | 1.75 | 4.63 | 5.84 | 6.62 | 1.92 | 2.52 | 37.05 |
| 1873 | 1.95 | 1.79 | 1.50 | 2.46 | 3.10 | 1.85 | 3.33 | 5.98 | 7.87 | 4.49 | 8.68 | 2.43 | 40.43 |
| 1874 | 2.50 | 2.83 | 3.52 | 1.24 | 1.48 | 2.99 | 3.06 | 4.71 | 3.16 | 6.11 | 1.08 | 7.49 | 40.17 |
| 1875 | 4.01 | 1.58 | 4.64 | 4.39 | 9.44 | 5.89 | 4.53 | 3.36 | 4.32 | 2.76 | 2.11 | 1.96 | 48.99 |
| 1876 | 2.08 | 4.06 | 0.44 | 8.45 | 2.64 | 6.58 | 3.69 | 2.24 | 3.99 | 6.90 | 6.35 | 4.16 | 51.58 |
| 1877 | 3.57 | 1.51 | 3.99 | 2.53 | 11.20 | 2.29 | 7.95 | 6.65 | 9.82 | 5.90 | 5.39 | 1.88 | 62.68 |
| 1878 | 3.63 | 5.75 | 1.81 | 5.47 | 11.39 | 6.90 | 5.96 | 12.15 | 2.78 | 8.66 | 7.71 | 4.22 | 76.43 |
| 1879 | 11.09 | 2.83 | 2.13 | 6.94 | 9.46 | 4.46 | 10.28 | 3.96 | 3.74 | 3.72 | 4.84 | 3.36 | 66.81 |
| 1880 | 2.77 | 2.71 | 0.66 | 4.13 | 8.01 | 10.65 | 5.23 | 8.70 | 4.79 | 12.65 | 6.25 | 1.80 | 66.85 |
| 1881 | 2.52 | 1.91 | 0.57 | 1.37 | 1.44 | 2.60 | 4.46 | 5.45 | 5.52 | 7.45 | 3.22 | 6.15 | 42.66 |
| 1882 | 3.75 | 4.18 | 2.27 | 4.64 | 6.76 | 5.08 | 3.63 | 6.19 | 3.13 | 10.70 | 10.13 | 8.69 | 69.14 |
| 1883 | 2.83 | 2.69 | 3.39 | 2.39 | 4.72 | 3.75 | 7.32 | 2.44 | 7.37 | 5.93 | 6.05 | 4.71 | 53.59 |
| 1884 | 2.69 | 1.59 | 1.47 | 2.25 | 1.57 | 2.04 | 3.31 | 9.85 | 2.63 | 9.87 | 9.28 | 4.70 | 51.15 |
| 1885 | 2.69 | 2.50 | 1.67 | 4.45 | 2.25 | 3.83 | 4.57 | 5.68 | 9.18 | 4.33 | 4.20 | 2.79 | 48.14 |
| 1886 | 3.16 | 2.76 | 1.32 | 0.54 | 3.84 | 7.90 | 4.43 | 6.11 | 7.32 | 6.81 | 4.55 | 1.65 | 49.89 |
| 1887 | 3.01 | 2.14 | 2.02 | 4.15 | 1.84 | 5.57 | 7.19 | 7.46 | 4.73 | 6.09 | 4.31 | 1.62 | 50.12 |
| 1888 | 2.83 | 5.36 | 4.03 | 8.27 | 12.29 | 17.51 | 4.18 | 7.08 | 13.71 | 6.01 | 4.56 | 3.28 | 89.06 |
| 1889 | 5.21 | 1.00 | 2.51 | 9.72* | 3.06 | 1.80 | 3.79 | 5.53 | 5.26 | 3.32 | 1.56 | 1.96 | 44.22 |
| 1890 | 5.38 | 2.08 | 0.57 | 4.85 | 2.29 | 4.47 | 7.78 | 5.73 | 5.31 | 7.98 | 7.90 | 3.11 | 57.40 |
| 1891 | 5.64 | 0.91 | 1.02 | 1.59 | 1.99 | 3.77 | 3.87 | 2.58 | 4.68 | 5.22 | 10.03 | 1.99 | 43.29 |
| 1892 | 2.78 | 1.98 | 3.28 | 2.61 | 1.85 | 2.68 | 4.12 | 2.82 | 4.89 | 7.96 | 1.63 | 3.84 | 40.49 |
| 1893 | 2.89 | 1.69 | 1.18 | 6.36 | 3.60 | 1.30 | 2.60 | 1.09 | 7.41 | 5.13 | 8.05 | 6.70 | 48.00 |
| 1894 | 3.92 | 0.73 | 1.60 | 2.98 | 10.47 | 2.58 | 5.08 | 7.45 | 7.67 | 5.57 | 5.25 | 10.90 | 63.23 |
| 1895 | 3.34 | 2.71 | 2.55 | 2.21 | 6.20 | 7.22 | 6.61 | 4.85 | 3.18 | 4.95 | 15.54 | 5.21 | 64.57 |
| 1896 | 3.02 | 3.24 | 6.24 | 1.87 | 6.88 | 2.68 | 7.19 | 2.42 | 4.56 | 2.85 | 2.83 | 4.10 | 47.87 |
| 1897 | 2.94 | 1.22 | 2.78 | 0.98 | 3.17 | 2.99 | 9.64 | 6.45 | 14.85 | 4.80 | 9.73 | 3.69 | 68.18 |
| 1898 | 3.97 | 1.33 | 1.11 | 0.84 | 1.08 | 3.30 | 8.40 | 9.23† | 10.48† | 2.63 | 7.72 | 2.64 | 53.33 |
| 1899 | 1.72 | 1.84 | 1.18 | 2.13 | 3.89 | 2.33 | 4.91 | 6.48 | 2.27 | 10.28 | 3.10 | 3.26 | 43.39 |
| Means 34 yrs† | 3.39 | 2.27 | 2.22 | 3.40 | 4.69 | 4.42 | 5.12 | 5.25 | 6.27 | 5.98 | 5.38 | 3.83 | 52.21 |

* Beginning with April, 1890, the record was kept at the Government Laboratory; before this date at the Public Library.

† Partly estimated, gage blown over.

‡ The means are for the 34 years from 1867 to 1900, inclusive.

TABLE 3.—Days on which one inch or more of rain fell at St. Johns, Antigua, during the eleven years from 1890 to 1900, inclusive.

| Year. | January. | | February. | | March. | | April. | | May. | | June. | | July. | | August. | | September. | | October. | | November. | | December. | |
|-------|----------|-------|-----------|-------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|---------|-------|------------|-------|----------|-------|-----------|-------|-----------|-------|
| | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. | Am't. | Date. |
| 1890 | | | | | | | 6.06 | 18 | | | | | | | 1.26 | 18 | 1.05 | 15 | | | | | | |
| 1890 | | | | | | | | | | | | | | | 1.50 | 25 | 1.50 | 25 | | | | | | |
| 1891 | | | | | | | 2.10 | 20 | | | 1.08 | 7 | 1.60 | 14 | 1.70 | 25 | 1.32 | 8 | 1.07 | 7 | 1.06 | 15 | | |
| 1891 | | | | | | | 1.75 | 22 | | | 1.15 | 21 | 1.48 | 19 | | | 1.50 | 7 | 1.95 | 14 | 2.10 | 21 | | |
| 1891 | | | | | | | | | | | | | 1.17 | 30 | | | | | 1.34 | 15 | | | | |
| 1891 | | | | | | | | | | | | | | | | | | 1.12 | 18 | | | | | |
| 1892 | 3.33 | 5 | | | | | | | | | 1.41 | 20 | | | | | 1.60 | 6 | 1.50 | 23 | 1.23 | 5 | | |
| 1892 | | | | | | | | | | | | | | | | | | | | | 1.31 | 6 | | |
| 1892 | | | | | | | | | | | | | | | | | | | | | 1.28 | 10 | | |
| 1893 | | | | | | | | | | | | | | | 1.50 | 15 | 1.48 | 23 | 1.50 | 15 | | | | |
| 1893 | | | | | | | | | | | | | | | | | | | 2.20 | 18 | | | | |
| 1894 | | | | | | | 4.23 | 19 | | | | | | | | | 1.26 | 4 | 1.13 | 18 | 1.90 | 24 | 1.44 | 12 |
| 1894 | | | | | | | | | | | | | | | | | 1.02 | 29 | | | 1.71 | 26 | 2.87 | 18 |
| 1895 | | | | | | | 2.15 | 21 | 3.71 | 23 | | | 1.55 | 23 | 2.81 | 22 | 1.61 | 1 | 1.21 | 19 | 1.10 | 16 | 3.35 | 1 |
| 1895 | | | | | | | | | 3.49 | 23 | | | | | 1.50 | 31 | 1.05 | 20 | | | 1.17 | 27 | 1.90 | 10 |
| 1895 | | | | | | | | | | | | | | | | | | | | | | | 2.23 | 12 |
| 1896 | 1.16 | 7 | | | | | | | 1.20 | 1 | 1.20 | 1 | 1.07 | 12 | 1.00 | 8 | | | 1.60 | 5 | 1.12 | 5 | 2.58 | 13 |
| 1896 | | | | | | | | | 1.10 | 2 | 1.02 | 4 | 1.01 | 13 | | | | | 1.00 | 30 | | | | |
| 1896 | | | | | | | | | 1.00 | 3 | | | | | | | | | | | 2.03 | 27 | | |
| 1896 | | | | | | | | | | | | | | | | | | | | | 4.78 | 23 | | |
| 1896 | | | | | | | | | | | | | | | | | | | | | 2.00 | 29 | | |
| 1897 | 1.50 | 5 | 1.68 | 5 | 2.36 | 9 | | | 3.19 | 17 | | | 1.24 | 25 | | | 1.09 | 24 | | | | | | |
| 1897 | | | | | | | | | | | | | 1.20 | 23 | | | | | | | | | | |
| 1898 | | | | | | | | | | | | | | | | | | | | | | | | |
| 1898 | | | | | | | | | | | | | | | | | | | | | | | | |
| 1898 | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1899 | | | | | | | | | | | | | | | | | | | | | | | | |
| 1900 | | | | | | | | | | | | | | | | | | | | | | | | |
| 1900 | | | | | | | | | | | | | | | | | | | | | | | | |

* Estimated, gage blown over.

TABLE 4.—Summary of meteorological records at St. Johns, Antigua, for the ten years 1891-1900.

| Years. | Mean air pressure. | | Mean temperature. | | | | Mean dew-point. | | Wind. | | | Precipitation. | | Number of— | | |
|---------------------|--------------------|----------------|-------------------|---------|---------|---------|-----------------|---------|----------------------------|---------|----------------------------|----------------|--|----------------|-------------|----|
| | | | Dry. | | Wet | | | | Prevalling di- rection. | | Average daily movement. | Total amount. | Number days with .01 inch or more. | Thunderstorms. | Earthquakes | |
| | 9 a. m. | 3 p. m. | 9 a. m. | 3 p. m. | 9 a. m. | 3 p. m. | 9 a. m. | 3 p. m. | 9 a. m. | 3 p. m. | | | | | | |
| | <i>Inches.</i> | <i>Inches.</i> | ° | ° | ° | | ° | ° | e. | e. | <i>Miles.</i> | <i>Inches.</i> | | | | |
| 1891 | 30.075 | 30.023 | 80.9 | 82.9 | 74.4 | 74.7 | 70.0 | 70.0 | e. | e. | | 57.40 | 267 | 21 | 9 | |
| 1892 | 30.097 | 30.035 | 81.4 | 83.3 | 73.8 | 74.3 | 69.0 | 69.0 | e. | e. | | 43.39 | 261 | 11 | 5 | |
| 1893 | 30.046 | 29.979 | 81.0 | 83.1 | 74.3 | 74.9 | 70.0 | 69.0 | e. | e. | | 40.49 | 256 | 22 | 3 | |
| 1894 | 30.077 | 30.007 | 80.8 | 83.1 | 73.9 | 74.7 | 70.0 | 69.0 | e. | e. | 209.8 | 48.00 | 247 | 13 | 10 | |
| 1895 | 30.070 | 30.004 | 80.1 | 83.4 | 74.7 | 75.6 | 70.0 | 70.0 | e. | e. | 207.0 | 63.23 | 252 | 19 | 8 | |
| 1896 | 30.089 | 30.019 | 81.4 | 84.2 | 74.6 | 75.5 | 70.0 | 70.0 | e. | e. | ene. | 196.4 | 64.57 | 239 | 17 | 5 |
| 1897 | 30.100 | 30.031 | 81.8 | 84.5 | 74.9 | 75.7 | 70.0 | 70.0 | e. | e. | | 180.6 | 47.87 | 226 | 11 | 8 |
| 1898 | 30.063 | 29.996 | 81.8 | 84.4 | 74.3 | 75.0 | 69.0 | 69.0 | e. | e. | | 186.4 | 63.13 | 239 | 14 | 7 |
| 1899 | 30.065 | 29.994 | 81.6 | 84.6 | 74.3 | 75.2 | 70.0 | 69.0 | e. | e. | | 185.6 | 53.23 | 221 | 17 | 8 |
| 1900 | 30.065 | 30.002 | 82.2 | 84.3 | 74.6 | 74.9 | 70.0 | 70.0 | e. | e. | | 170.3 | 43.39 | 194 | 3 | 11 |
| Secular means | 30.075 | 30.009 | 81.3 | 83.8 | 74.4 | 75.0 | 69.8 | 69.5 | e. | e. | 190.9 | 52.46 | 240.2 | 15.3 | 7.4 | |

NOTE.—The observations were made on local time.—En.

TABLE 5.—Monthly and annual average rainfall (in inches and hundredths) on the island of Antigua for a period of twelve years, 1888 to 1899, inclusive.

| Year. | Number of stations. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---------------|---------------------|----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|---------|
| 1888 | 47 | 2.09 | 1.83 | 1.44 | 2.54 | 2.44 | 3.48 | 6.06 | 7.24 | 5.30 | 5.40 | 3.33 | 1.53 | 44.02 |
| 1889 | 51 | 1.70 | 5.07 | 4.05 | 6.96 | 9.88 | 14.36 | 3.10 | 5.27 | 11.15 | 5.17 | 3.33 | 3.69 | 73.51 |
| 1890 | 46 | 3.60 | 1.18 | 1.84 | 7.53 | 2.31 | 1.04 | 2.52 | 3.72 | 5.23 | 2.82 | 1.33 | 2.57 | 35.79 |
| 1891 | 45 | 3.67 | 2.24 | 0.34 | 2.71 | 1.87 | 4.02 | 9.95 | 5.53 | 3.63 | 7.01 | 6.70 | 1.86 | 50.01 |
| 1892 | 53 | 5.77 | 0.82 | 0.86 | 1.18 | 2.35 | 3.27 | 3.15 | 2.16 | 4.23 | 4.35 | 8.99 | 1.31 | 38.53 |
| 1893 | 54 | 1.78 | 1.50 | 2.66 | 2.10 | 2.04 | 2.09 | 4.60 | 2.99 | 6.53 | 6.42 | 1.16 | 2.89 | 38.69 |
| 1894 | 68 | 1.89 | 1.03 | 1.29 | 2.76 | 2.76 | 1.31 | 1.87 | 1.38 | 5.31 | 5.66 | 5.26 | 3.58 | 38.87 |
| 1895 | 69 | 2.30 | 0.51 | 1.45 | 2.80 | 7.94 | 1.57 | 3.65 | 6.46 | 7.41 | 5.13 | 5.08 | 3.83 | 52.91 |
| 1896 | 56 | 3.10 | 1.71 | 2.03 | 1.54 | 6.33 | 7.33 | 5.89 | 4.23 | 3.89 | 7.11 | 13.66 | 3.55 | 59.85 |
| 1897 | 54 | 2.28 | 2.34 | 6.18 | 1.15 | 5.91 | 2.25 | 6.01 | 1.70 | 3.73 | 1.86 | 2.82 | 9.69 | 39.67 |
| 1898 | 66 | 2.08 | 1.19 | 2.39 | 0.95 | 2.00 | 1.95 | 6.69 | 5.09 | 12.30 | 8.29 | 3.29 | 2.68 | 48.85 |
| 1899 | 63 | 3.17 | 1.20 | 0.86 | 0.46 | 1.17 | 2.67 | 7.50 | 7.14 | 10.54 | 4.98 | 5.60 | 1.54 | 47.50 |
| Secular means | | 2.79 | 1.71 | 2.12 | 2.76 | 3.91 | 3.78 | 5.06 | 4.47 | 6.53 | 5.10 | 5.49 | 3.55 | 47.35 |

The average rainfall for twenty-six years, from 1874 to 1899, inclusive, was 46.00 inches.

TABLE 6.—Average annual rainfall on the island of Antigua for a period of twenty-six years, 1874 to 1899, inclusive.

| Year. | Number of stations. | Rainfall. | Departure from the normal. |
|-------|---------------------|-----------|----------------------------|
| | | Inches. | Inches. |
| 1874 | 41 | 31.16 | -14.84 |
| 1875 | 40 | 26.78 | -17.22 |
| 1876 | 36 | 41.98 | -4.02 |
| 1877 | 38 | 49.05 | + 8.05 |
| 1878 | 53 | 47.11 | + 1.11 |
| 1879 | 52 | 61.54 | +15.54 |
| 1880 | 46 | 49.69 | + 3.69 |
| 1881 | 44 | 53.75 | + 7.75 |
| 1882 | 45 | 33.04 | -12.96 |
| 1883 | 56 | 55.51 | + 9.51 |
| 1884 | 56 | 43.96 | - 2.02 |
| 1885 | 58 | 43.39 | - 2.61 |
| 1886 | 55 | 47.78 | + 1.78 |
| 1887 | 50 | 43.68 | - 2.32 |
| 1888 | 47 | 44.23 | - 1.77 |
| 1889 | 50 | 73.59 | +27.59 |
| 1890 | 45 | 33.00 | -13.00 |
| 1891 | 45 | 50.01 | + 4.01 |
| 1892 | 58 | 38.53 | - 7.47 |
| 1893 | 54 | 38.69 | - 7.31 |
| 1894 | 68 | 38.87 | - 7.13 |
| 1895 | 69 | 52.91 | + 6.91 |
| 1896 | 56 | 59.85 | +13.85 |
| 1897 | 54 | 39.67 | - 6.33 |
| 1898 | 66 | 48.85 | + 2.85 |
| 1899 | 63 | 47.50 | + 1.50 |